# CLAIMS

1. A laser irradiation method comprising:

blocking a low-intensity part of a laser beam emitted from a laser oscillator by making the laser beam pass through a slit; and

projecting an image formed at the slit to an irradiation surface by a convex cylindrical lens;

wherein the laser beam is shaped into a linear beam on the irradiation surface.

2. A laser irradiation method comprising:

blocking a low-intensity part of a laser beam emitted from a laser oscillator by making the laser beam pass through a slit; and

projecting an image formed at the slit to an irradiation surface by a convex cylindrical lens;

wherein the laser beam is shaped into a linear beam on the irradiation surface, and

wherein the slit, the convex cylindrical lens, and the irradiation surface are arranged so that a distance (M1) between the slit and the convex cylindrical lens and a distance (M2) between the convex cylindrical lens and the irradiation surface satisfy following equations 1 and 2:

$$M1=f(s+D)/D \qquad \text{[Equation 1]}$$

$$M2=f(s+D)/s \qquad \text{[Equation 2]}$$

where s is a width of the slit, D is a length of the linear beam in a long-side direction, and f is a focal length of the convex cylindrical lens.

3. The laser irradiation method according to claim 1 or claim 2,

wherein a mirror for bending a traveling direction of the laser beam by a predetermined angle is provided between the laser oscillator and the slit.

4. The laser irradiation method according to claim 1 or claim 2,

wherein a second convex cylindrical lens is provided between the convex cylindrical lens and the irradiation surface in such a way that the second convex cylindrical lens is rotated by $90^{\circ}$ from the convex cylindrical lens.

5. A laser irradiation apparatus comprising:

a laser oscillator;

a slit for blocking a low-intensity part of a laser beam emitted from the laser oscillator; and

a convex cylindrical lens for projecting to an irradiation surface an image formed at the slit in which the low-intensity part is blocked;

wherein the laser beam is shaped into a linear beam on the irradiation surface.

6. A laser irradiation apparatus comprising:

a laser oscillator;

a slit for blocking a low-intensity part of a laser beam emitted from the laser oscillator; and

a convex cylindrical lens for projecting to an irradiation surface an image formed at the slit in which the low-intensity part is blocked;

wherein the laser beam is shaped into a linear beam on the irradiation surface, and

wherein the slit, the convex cylindrical lens, and the irradiation surface are arranged so that a distance (M1) between the slit and the convex cylindrical lens and a distance (M2) between the convex cylindrical lens and the irradiation surface satisfy following equations 1 and 2:

$M1=f(s+D)/D$ [Equation 1]

$M2=f(s+D)/s$ [Equation 2]

where s is a width of the slit, D is a length of the linear beam in the long-side direction, and f is a focal length of the convex cylindrical lens.

7. The laser irradiation apparatus according to claim 5 or claim 6,

wherein a mirror for bending a traveling direction of the laser beam by a predetermined angle is provided between the laser oscillator and the slit.

8. The laser irradiation apparatus according to claim 5 or claim 6,

wherein a second convex cylindrical lens is provided between the convex cylindrical lens and the irradiation surface in such a way that the second convex cylindrical lens is rotated by $90^{\circ}$ from the convex cylindrical lens.

9. A laser irradiation method comprising:

bending a laser beam emitted from a laser oscillator by a mirror tilted by a predetermined angle;

making the laser beam pass through a first convex spherical lens so as to form a linear beam due to astigmatism;

blocking a low-intensity part of the linear beam by a slit; and

projecting to an irradiation surface an image of the linear beam at the slit by using a second convex spherical lens;

wherein the laser beam is shaped into a linear beam.

10. A laser irradiation method comprising:

bending a laser beam emitted from a laser oscillator by a mirror tilted by a predetermined angle;

making the laser beam pass through a first convex spherical lens so as to form a linear beam due to astigmatism;

blocking a low-intensity part of the linear beam by a slit; and

projecting to an irradiation surface an image of the linear beam at the slit by using a second convex spherical lens;

wherein the slit, the second convex cylindrical lens, and the irradiation surface are arranged so that a distance (M1) between the slit and the second convex cylindrical lens and a distance (M2) between the second convex cylindrical lens and the irradiation surface satisfy equations 1 and 2:

$$M1=f(s+D)/D \qquad \text{[Equation 1]}$$

$$M2=f(s+D)/s \qquad \text{[Equation 2]}$$

where s is a width of the slit, D is a length of the linear beam in the long-side direction, and f is a focal length of the second convex spherical lens.

11. A laser irradiation apparatus comprising:

a laser oscillator;

a mirror tilted by a predetermined angle for guiding a laser beam emitted from the

laser oscillator to a first convex spherical lens;

the first convex spherical lens for shaping the laser beam reflected on the mirror into a linear beam due to astigmatism;

a slit for blocking a low-intensity part of the linear beam; and

a second convex spherical lens for projecting to an irradiation surface an image of the linear beam at the slit.

12. A laser irradiation apparatus comprising:

a laser oscillator;

a mirror tilted by a predetermined angle for guiding a laser beam emitted from the laser oscillator to a first convex spherical lens;

the first convex spherical lens for shaping the laser beam reflected on the mirror into a linear beam due to astigmatism;

a slit for blocking a low-intensity part of the linear beam; and

a second convex spherical lens for projecting to an irradiation surface an image of the linear beam at the slit;

wherein the slit, the second convex cylindrical lens, and the irradiation surface are arranged so that a distance (M1) between the slit and the second convex cylindrical lens and a distance (M2) between the second convex cylindrical lens and the irradiation surface satisfy equations 1 and 2:

$$M1=f(s+D)/D \qquad \text{[Equation 1]}$$

$$M2=f(s+D)/s \qquad \text{[Equation 2]}$$

where s is a width of the slit, D is a length of the linear beam in the long-side direction, and f is a focal length of the second convex spherical lens.

13. A laser irradiation method comprising:

blocking a low-intensity part of a laser beam emitted from a laser oscillator by making the laser beam pass through a slit; and

projecting an image formed at the slit to an irradiation surface by a convex spherical lens;

wherein the laser beam is shaped into a linear beam on the irradiation surface, and

wherein the slit, the convex spherical lens, and the irradiation surface are arranged so that a distance (M1) between the slit and the convex spherical lens and a distance (M2) between the convex spherical lens and the irradiation surface satisfy following equations 1 and 2:

$$M1=f(s+D)/D \qquad \text{[Equation 1]}$$

$$M2=f(s+D)/s \qquad \text{[Equation 2]}$$

where s is a width of the slit, D is a length of the linear beam in a long-side direction, and f is a focal length of the convex spherical lens.